

Remarks/Arguments

Claims 1-13 remain in this application. Claims 4-7 have been canceled.

Objection to Claims 2 and 3

The Examiner objected to claims 2 and 3 regarding informalities. Applicant has amended claims 2 and 3 as suggested by the Examiner. Applicants request that the objection be removed.

Rejection of Claims 1-3, 8-11, and 13 under 35 U.S.C. §103(a)

The Examiner rejected claims 1-3, 8-11, and 13 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,200,354 (Hoffman) in view of U.S. Patent No. 5,684,631 (Greywall). Applicant respectfully traverses the rejection.

Claim 1

“To establish a *prima facie* case of obviousness three criteria must be met. First, there must be some suggestion or motivation to modify the reference. Second, the reference(s) must provide a reasonable expectation of success. The third requirement for a *prima facie* case of obviousness is that the reference must teach or suggest all limitations of the claim at issue. The teaching or suggestion to make the combined combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.” *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). “Hence, elements of separate patents cannot be combined when there is no suggestion of such combination in those patents. *Panduit Corp. v. Dennison Manufacturing Co.*, 1 U.S.P.Q.2d 1593 (Fed. Cir. 1987).”

Greywall is teaching a nonanalogous field and solving a different problem

The Examiner has cited Greywall to cure the defects of Hoffman regarding claims 1-3, 8-11, and 13. However, Greywall is teaching a switching device for a fiber optic transmission system, a field nonanalogous to the microscopy of the present invention. Assuming *arguendo* that the field of Greywall’s teachings is analogous to microscopy, Greywall is still solving a different problem than the present invention. The present invention addresses phase-contrast or

modulation-contrast in a microscope. That is, problems associated with improving the quality of a visual image in a microscope. Greywall is addressing the problems of directing light, not modifying light: “The *reflected* optical signal can be *directed* to different receiving waveguides by changing the amplitude of the applied voltage” (Abstract). Therefore, Greywall does not satisfy the *prima facie* requirement: “The teaching or suggestion to make the combined combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant’s disclosure.”

Greywall does not teach, suggest, or motivate a transmissive layer modifying phase or amplitude

Amended claim 1 recites: “wherein the at least one layer modifying the phase or amplitude is *transmissive*” Assuming *arguendo* that Greywall can be applied to Hoffman and the present invention, Greywall teaches a reflective zone plate: “The optical modulator/switch includes a reflective zone plate for reflecting an incident light beam.” (col. 1, lines 46-48). Greywall contains no teaching that the portion of his switch that works on a light beam (the reflective plate) is anything other than reflective. That is, Greywall has no teaching that the aforementioned portion is ever **transmissive**.

Greywall does not teach, suggest, or motivate the tiltable modulator of claim 1

Amended claim 1 recites: “wherein the modulator...is mounted tiltably.” The Examiner has cited Greywall regarding a tiltable modulator. However, as shown above, Greywall is not applicable to claim 1 and even if it were, Greywall does not teach an element analogous to the modulator recited in claim 1. Therefore, Greywall cannot be combined with Hoffman to teach, suggest, or motivate making Hoffman’s modulator tiltable.

Hoffman teaches against a tiltable modulator

Hoffman contains no teachings that his modulator 8 should be tiltable. Further, Hoffman teaches that the only part of his system that could be tiltable would be prism 4. However, Hoffman clearly teaches that the prism is completely optional and thus, that **any tilting function is likewise optional**: “An optically plane glass plate or prism 4 may be located before the condensor 5 as shown, or located elsewhere or eliminated depending upon the optical system employed.” (col. 4, lines 9-12). Alternately stated, a prism, and further still a tilting prism, are of

no importance to Hoffman's system and can be easily omitted without affecting his invention. Thus Hoffman clearly teaches against modifying his modulator to include any tilting functionality.

Hoffman in view of Greywall fails to meet the three requirements for establishing a prima facie case of obviousness with respect to claim 1. Therefore claim 1 is patentable over the cited prior art. Claims 2, 3, and 8-10, dependent from claim 1, enjoy the same distinction from the cited prior art. Applicants request that the rejection be removed.

Claim 11

Greywall does not teach, suggest, or motivate a transmissive layer modifying phase or amplitude

Claim 11 recites: "wherein at least a portion of the at least one layer modifying the phase or amplitude is *transmissive*." As shown for claim 1, Greywall does not teach, suggest, or motivate this element of claim 11.

Greywall does not teach polarization or a retardation plate

Claim 11 recites: "optical polarization means in combination with retardation plates are present." Photonic.com/dictionary defines polarization as:

With respect to light radiation, the restriction of the vibrations of the magnetic or electric field vector to a single plane. In a beam of electromagnetic radiation, the polarization direction is the direction of the electric field vector (with no distinction between positive and negative as the field oscillates back and forth). The polarization vector is always in the plane at right angles to the beam direction. Near some given stationary point in space the polarization direction in the beam can vary at random (unpolarized beam), can remain constant (plane-polarized beam), or can have two coherent plane-polarized elements whose polarization directions make a right angle. In the latter case, depending on the amplitude of the two waves and their relative phase, the combined electric vector traces out an ellipse and the wave is said to be elliptically polarized. Elliptical and plane polarizations can be converted into each other by means of birefringent optical systems.

Photonic.com/dictionary defines a wave plate as: "An optical element having two principal axes, slow and fast, that *resolve an incident polarized beam into two mutually perpendicular polarized beams*. The emerging beam recombines to form a particular single

polarized beam. Wave plates produce full-, half- and quarter- wave retardations. **Also known as retardation plate.**” Col. 9, lines 3-31, cited by the Examiner, are silent regarding either polarization or retardation plates. Lines 3-23 teach varying a height difference between reflective and non-reflective portions of the plate 8a. The plane of the light is not affected (polarized). Lines 24-31 teach materials, particularly surface treatment, to use for the switch. Again, Greywall provides no teachings regarding shifting a plane of the light. Nowhere in these lines or in any of the figures is a retardation plate shown. That is, a plate through which the light passes and which can vary the speed of the light according to the orientation of the plate. **In fact, the light never passes through any kind of plate in Greywall – it is always reflected.**

Hoffman in view of Greywall fails to teach, suggest, or motivate the elements of claim 11. Therefore, claim 11 is patentable over the cited prior art.

Claim 13

The Examiner applied the same rationale to claims 1 and 13. Claim 13 recites substantially the same elements as claim 1. Applicant has shown that claim 1 is patentable over Hoffman in view of Greywall. Therefore, claim 13 also is patentable over the cited prior art.

Rejection of Claim 12 under 35 U.S.C. §103(a)

The Examiner rejected claim 12 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,200,354 (Hoffman) in view of U.S. Patent No. 6,462,858 (MacDonald). Applicant respectfully traverses the rejection.

Hoffman does not teach a tiltable modulator

Claim 12 recites: “wherein various modulators are arranged on a carrier in a manner introducible into the beam path of the microscope, and are selectably mounted, tiltably individually or tiltably together with the carrier, on that carrier.” The Examiner has already admitted that Hoffman does not teach a tilting modulator: “Hoffman lacks reference to the modulator tilting.” (page 3, lines 9 and 10 of the Office Action). Hoffman’s tiltable prism 4 is not analogous to the tiltable modulator of claim 12. Prism 4 does not tilt to vary modulation as

does the modulator of claim 12. Further, Applicant has shown in the arguments for claim 1 that the only tilting element of Hoffman's invention, the prism, is completely optional.

MacDonald is teaching a nonanalogous field and solving a different problem

MacDonald is teaching an attenuator, not a phase modulator. MacDonald is solving the problem of response time for an attenuator, a problem unrelated to the invention of claim 12. For example, MacDonald references the problem of saturation in a receiver (col. 1, lines 9-13). MacDonald also frames his invention in the field of telecommunications in col. 4, lines 37-41. MacDonald teaches using a single deformable membrane, manipulated using electrostatic deflection, and is silent regarding selecting among a variety of tiltable modules as recited in claim 12. Therefore, MacDonald does not satisfy the *prima facie* requirement: "The teaching or suggestion to make the combined combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure."

Hoffman does not teach multiple modulators

Claim 12 recites: "...various modulators are arranged on a carrier in a manner introducible into the beam path of the microscope, and are selectably mounted, tiltably individually or tiltably together with the carrier, on that carrier." Hoffman clearly teaches only a single modulator in his system. Assuming *arguendo* that MacDonald's attenuator is analogous to a modulator of claim 12, Applicant can find no reference to "multiple regions" in MacDonald's attenuator, as asserted by the Examiner. That is, MacDonald does not differentiate among portions of his membrane.

MacDonald teaches against a non-reflective modifying layer

Claim 12 recites: "wherein at least a portion of the at least one layer modifying the phase or amplitude is *non-reflective*." MacDonald teaches a reflective membrane. (Abstract; col. 1, lines 56-63; *ad nauseum*). The figures of MacDonald also show that the surfaces of his attenuator are always reflective. MacDonald's invention does not work unless the surfaces are reflective.

Hoffman in view of MacDonald fails to meet the requirement for establishing a *prima facie* case of obviousness with respect to claim 12. Therefore, claim 12 is patentable over the cited prior art. Applicant requests that the rejection be removed.

Conclusion

Applicant respectfully submits that all pending claims are now in condition for allowance, which action is courteously requested.

Respectfully submitted,



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